of Tennessee

Policy

Reimbursement Policy

Bone Turnover Markers Testing

I. Policy Description

Bone metabolism involves a continual, dynamic equilibrium between bone growth and resorption. Bone turnover markers (BTMs) are biochemical markers for assessment of bone formation or bone resorption. These markers may be useful in determining risk of fracture and bone loss (Rosen, 2023b).

II. Indications and/or Limitations of Coverage

Application of coverage criteria is dependent upon an individual's benefit coverage at the time of the request. Specifications pertaining to Medicare and Medicaid can be found in the "Applicable State and Federal Regulations" section of this policy document. *Bone turnover markers are listed in Note 1.*

1) For individuals treated with bisphosphonates, measurement of bone turnover markers to assess an individual's compliance with bisphosphonate therapy or for fracture risk prediction **MEETS COVERAGE CRITERIA** at the following intervals:
   a) To establish baseline levels before initiating bisphosphonate treatment
   b) Every three months after initiation or change of therapy for the first year.
   c) Every two years when no medication changes have occurred.
2) For individuals with osteoporosis, measurement of bone turnover markers to monitor teriparatide treatment **DOES NOT MEET COVERAGE CRITERIA**.

The following does not meet coverage criteria due to a lack of available published scientific literature confirming that the test(s) is/are required and beneficial for the diagnosis and treatment of an individual's illness.

3) As a diagnostic test for osteoporosis, measurement of bone turnover markers **DOES NOT MEET COVERAGE CRITERIA**.
4) In the diagnosis and management of patients with other conditions associated with high rates of bone turnover, measurement of bone turnover markers **DOES NOT MEET COVERAGE CRITERIA**.

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NOTES:

Note 1: Bone turnover markers include (Rosen, 2023a, 2023b; Talwar, 2024):

1. Bone formation markers
   a. Serum bone–specific alkaline phosphatase (BSAP/BALP)
   a. Serum osteocalcin (OC)
   b. Serum type 1 procollagen (C-terminal/N-terminal): C1NP or P1NP
1. Bone resorption markers
   a. Urinary hydroxyproline (HYP)
   b. Urinary total pyridinoline (PYD)
   c. Urinary free deoxypyridinoline (DPD)
   d. Urinary or serum collagen type 1 cross-linked N-telopeptide (NTX)
   e. Urinary or serum collagen type 1 cross-linked C-telopeptide (CTX)
   f. Bone sialoprotein (BSP)
   g. Serum Tartrate-resistant acid phosphatase 5b (TRACP5b)
   h. Cathepsin K

III. Applicable State and Federal Regulations

DISCLAIMER: If there is a conflict between this Policy and any relevant, applicable government policy for a particular member [e.g., Local Coverage Determinations (LCDs) or National Coverage Determinations (NCDs) for Medicare and/or state coverage for Medicaid], then the government policy will be used to make the determination. For the most up-to-date Medicare policies and coverage, please visit the Medicare search website: https://www.cms.gov/medicare-coverage-database/search.aspx. For the most up-to-date Medicaid policies and coverage, visit the applicable state Medicaid website.

Food and Drug Administration (FDA)

Several tests for bone turnover markers have been cleared by the U.S. Food and Drug Administration (FDA) using the 510(k) process including the collagen cross-links tests: Osteomark® NTX Urine ELISA test from Abbott which measures cross-linked N-telopeptides of type 1 collagen (NTx), and Serum Crosslaps One-step ELISA test which measures hydroxyproline. Other bone turnover marker tests cleared through the FDA 510(k) process tests include: Access Ostase from Beckman Coulter which measures bone-specific alkaline phosphatase (B-ALP), N-MID Osteocalcin One-step ELISA from Osteometer Bio Tech (merged with Osteopro and now called Nordic Biotech) which measures osteocalcin (OC), and Elecsys® N-MID Osteocalcin Immunoassay (Roche Diagnostics).

Many labs have developed specific tests that they must validate and perform in house. These laboratory-developed tests (LDTs) are regulated by the Centers for Medicare and Medicaid

(CMS) as high-complexity tests under the Clinical Laboratory Improvement Amendments of 1988 (CLIA '88). LDTs are not approved or cleared by the U. S. Food and Drug Administration; however, FDA clearance or approval is not currently required for clinical use.

IV. Applicable CPT/HCPCS Procedure Codes

CPT	Code Description
82523	Collagen cross links, any method
83500	Hydroxyproline; free
83505	Hydroxyproline; total
83937	Osteocalcin (bone gla protein)
84080	Phosphatase, alkaline; isoenzymes

Procedure codes appearing in Medical Policy documents are included only as a general reference tool for each policy. They may not be all-inclusive.

V. Evidence-based Scientific References

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